



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,098	12/21/2005	Takashi Ito	9369-114US (T37-196236C)	8148
570 7590 03/13/2009 PANITCH SCHWARZE BELISARIO & NADEL LLP ONE COMMERCE SQUARE 2005 MARKET STREET, SUITE 2200 PHILADELPHIA, PA 19103			EXAMINER EOFF, ANCA	
			ART UNIT 1795	PAPER NUMBER
			MAIL DATE 03/13/2009	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/562,098	<b>Applicant(s)</b> ITO ET AL.	
	<b>Examiner</b> ANCA EOF	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 5-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 5-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 1, 3 and 5 -10 are pending in the application. Claims 2 and 4 are canceled.
2. The foreign priority document JP 2003-180470, filed on June 25, 2003 was received and acknowledged. However, in order to benefit of the earlier filing date, a certified English translation is required.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

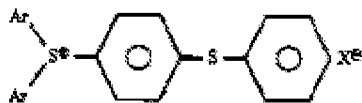
4. Claims 1, 3, 5-6 and 9-10 are rejected under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158).

With regard to claims 1, 3 and 10, Ohkuma et al. disclose a photosensitive composition containing a radical-polymerizable monomer, a cationic-polymerizable monomer, a radical polymerization initiator and a cationic-polymerization initiator (abstract).

The radical-polymerization initiator may be a compound exhibiting effective light absorbtion in UV region (column 8, lines 58-60).

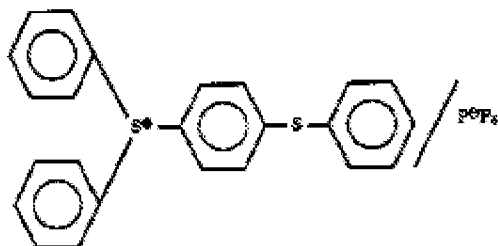
The cationic-polymerization initiator may be represented by the formula (I):

Art Unit: 1795



(I) (column 10, lines 1-10), wherein Ar is an aryl group and  $X^-$  may be  $PF_6^-$  and  $SbF_6^-$  (column 10, lines 23-24). This compound having as Ar a phenyl group is equivalent to the compound of formula (I) of the instant application.

A specific example of the compound of formula (I) is represented by the formula (II):



(II) (column 12, lines 40-49).

The compound of formula (II) is equivalent to the compound of formula (I) of the instant application when M is a phosphorus atom.

However, Ohkuma et al. do not teach the purity of the cationic-polymerization initiator, as required by the instant application.

Date et al. disclose a method of manufacturing sulfonium salts used as photocationic polymerization initiators for resists (par.0045).

In Examples 1-3, Date et al. disclose the synthesis of (4-phenylthiophenyl) diphenylsulfonium hexafluorophosphate with a purity of 99 % (par.0047-0062). Date et al. further disclose that  $^{13}C$ -NMR analysis and IR analysis indicated that the (4-

Art Unit: 1795

phenylthiophenyl) diphenylsulfonium hexafluorophosphate comprises small amounts of raw materials, such as diphenyl sulfoxide, diphenyl (par.0050, 0055 and 0058).

In Example 5, Date et al. disclose the synthesis of (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate with a purity of 99% (par.0063-0065). It is not explicitly specified that (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate is synthesized in Example 5 but the ingredients are the same as for Example 2 which leads to (4-phenylthiophenyl) diphenylsulfonium hexafluorophosphate except that potassium hexafluoroantimonate replaces potassium hexafluorophosphate. Date et al. further disclose that  $^{13}\text{C}$ -NMR analysis and IR analysis indicated that the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate comprises small amount of raw materials diphenyl sulfoxide, diphenyl sulfide(par.0052-0053 and par.0063-0064).

It is the examiner's position that there is no compound represented by formula (II) of the instant application in the (4-phenylthiophenyl) diphenylsulfonium hexafluorophosphate of Examples 1-3 and (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate of Example 5 of Date et al. Therefore the limitations of claims 1 and 10 for the quantity of compound of formula (II) are met.

It would have been obvious for one of ordinary skill in the art to use the sulfonium salt, such as (4-phenylthiophenyl) diphenylsulfonium hexafluorophosphate and (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate with a purity of 99% obtained in the process of Date et al. as photocationic polymerization initiators in the composition of Ohkuma et al., since Date et al. specifically indicate this use for the high-purity sulfonium salts (Date et al., par.0045 and par.0062).

With regard to claim 5, Ohkuma et al. disclose that the cationic-polymerizable monomer comprises at least an epoxy group (see examples in column 5-6).

With regard to claim 6, Ohkuma et al. disclose that the radical-polymerizable monomer includes compounds with (meth)acryl groups (see examples in column 3, lines 17-48).

With regard to claim 9, Date et al. disclose the synthesis of (4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate in Example 5 (par.0063-0065). The purity of the compound is more than 99% so raw materials are comprised in an amount of less than 1% (par.0064 shows that raw materials are the impurities found in the compound).

Since the raw materials for the synthesis of 4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate and 4-phenylthiophenyl)diphenylsulfonium hexafluorophosphate comprise about 30% diphenylsulfoxide (Examples 2 and 5 in par.0052-0053 and par.0063), it would be expected that the mixture of raw materials left as residues in the of 4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate and 4-phenylthiophenyl)diphenylsulfonium hexafluorophosphate would comprise 30% diphenylsulfoxide. Therefore, the 4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate obtained in Example 5 and the 4-phenylthiophenyl)diphenylsulfonium hexafluorophosphate obtained in Example 2 would comprise less than 0.3% of diphenylsulfoxide, which encompasses the range claimed in claim 9 of the instant application.

Art Unit: 1795

5. Claims 7-8 are rejected under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158) as applied to claim 1 and in further view of Steinmann (US Pg-Pub 2004/0137368).

With regard to claims 7-8, Ohkuma modified by Date teach the composition of claim 1 (see paragraph 4 of the Office Action) but Ohkuma and Date fail to disclose that the composition further comprises an oxetane compound and a polyalkylene ether compound.

Steinmann discloses a radiation-curable composition comprising:

- (A) at least one cationically polymerizing organic substance;
- (B) at least one free-radical polymerizing organic substance;
- (C) at least one cationic polymerization initiator;
- (D) at least one free-radical polymerization initiator (par.0023-0027).
- (E) at least one hydroxyl-functional compound (par.0028)
- (F) at least one hydroxyl-functional oxetane compound (par.0029).

The preferred compound (F) is 3-ethyl-3-hydroxymethyl-oxetane (par.0110)

In Example 1 (table 2, par.0151), Steinmann specifically discloses that 3-ethyl-3-hydroxymethyl-oxetane (Cyracure UVR 6000, in table 1, par.0143) is comprised in the radiation-curable composition at a ratio of 26.78 wt.% with respect to the 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carboxylate (Cyracure UVR 6110, in table 1, par.0143).

Steinmann discloses that the one hydroxyl-functional compound (E) (par.0023-par.0028) may be polypropylene glycols of various molecular weights (par.0094), glycerine propoxylated polyether triol and polyethyleneglycols (par.0103). These compounds are equivalent to the polyalkylene ether compounds of the instant application.

In Example 1 (table 2, par.0151), Steinmann specifically discloses that glycerine propoxylated polyether triol (Voranol CP 450 in table 1, par.0143) is comprised in the radiation-curable composition at a ratio of 17.85 wt.% with respect to 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carboxylate (Cyracure UVR 6110, in table 1, par.0143).

The composition of Steinmann et al. gives exceptionally high photospeed, has low viscosity, low humidity sensitivity and high temperature resistance (par.0002).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add a at least one hydroxyl-functional compound, such as polypropylene glycols of various molecular weights, glycerine propoxylated polyether triol and polyethyleneglycols and at least one hydroxyl-functional oxetane compound , as disclosed by Steinmann, to the composition of Ohkuma modified by Date, in order to obtain a composition with exceptionally high photospeed, has low viscosity, low humidity sensitivity and high temperature resistance (Steinmann, par.0002).



***Response to Arguments***

6. Applicant's arguments filed on December 19, 2008 have been fully considered but they are not persuasive.

On pages 4-7 of the Remarks, the applicant argues the rejection of claims 1,3,5-6 and 9-10 under 35 USC 103(a) over Okhuma (US Patent 5,776,636) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document US Pg-Pub 2004/0030158).

On page 6 of the Remarks, the applicant argues that the radical polymerization initiator of Okhuma is sensitive to visible light (column 8, lines 60-62). However, the examiner would like to show that Okhuma clearly teaches that the radical-polymerization initiators exhibit effective light absorption in UV (column 8, lines 58-60).

On pages 6-8, the applicant further argues that one skilled in the art would not have been motivated to use the composition of Okhuma in stereolithography. The examiner would like to point out the fact that the limitation of claim 1 "for stereolithography" is merely an intended use and adds no patentable weight to the claim.

If the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165 (Fed. Cir. 1999). See also *Rowe v. Dror*, 112 F.3d 473, 478, 42 USPQ2d 1550, 1553 (Fed. Cir. 1997) ("where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention, the preamble is not a claim limitation") (MPEP 2111.02.II- Preamble Statement Reciting Purpose or Intended Use)

The composition of Okhuma modified by Date has all the components of the resin composition of claim 1 of the instant application so it renders obvious the "resin composition for stereolithography" of the instant application.

On pages 12-13, the applicant argues the rejection of claims 7-8 under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158) as applied to claim 1 and in further view of Steinmann (US Pg-Pub 2004/0137368).

The applicant argues that even utilizing an oxetane or polyalkylene ether compound in the composition of Okhuma would not result in a composition for stereolithography as in the instant application.

The examiner respectfully disagrees and would like to show that the composition of Okhuma modified by Date and Steinmann has all the compounds of the resin composition of the instant application. As the limitation "for stereolithography" is merely an intended use and adds no patentable weight to the claim, the composition of Okhuma modified by date and Steinmann is equivalent to the composition of claims 7-8 of the instant application.

7. Applicant's arguments, filed December 19, 2008, with respect to :

- the rejection of claims 1, 3, 5-6 and 10 under 35 USC 103(a) over Thommes et al. (US Pg-Pub 2003/0149124) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document US Pg-Pub 2004/0030158), and

- the rejection of claims 1,3 , 5-6 and 10 under 35 USC 103(a) over Melisaris et al. (US Patent 6,350,403) in view of Date et al. (WO 02/48101 wherein the citations are from the English equivalent document US Pg-Pub 2004/0030158) have been fully considered and are persuasive. The above mentioned rejections have been withdrawn.

On page 9 of the Remarks, the applicant shows that Thommes et al. uses CPI-6976, which is identical to UVI-6976. The Material Data Sheet attached shows that UVI-6976 has the same composition as UVI-6974.

The photoinitiator UVI-6974 is used in the Comparative Examples 1-2 of the instant application and, since UVI-6974 and CPI-6976/UVI-6976 have the same composition, the Comparative Examples 1-2 correspond to the composition of Thommes et al.

As the specification clearly shows that the composition of the instant application leads to unexpected results when compared to the composition of the Comparative Examples 1-2, the rejection of claims 1, 3, 5-6 and 10 under 35 USC 103(a) over Thommes et al. (US Pg-Pub 2003/0149124) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document US Pg-Pub 2004/0030158) is withdrawn.

On page 12 of the Remarks, the applicant shows that Melisaris uses the cationic photoinitiator UVI-6974, which is used in the Comparative Examples 1 and 2 of the specification of the instant application.

As the specification clearly shows that the composition of the instant application leads to unexpected results when compared to a composition comprising UVI-6974

Art Unit: 1795

(such as the composition of Melisaris et al.), the rejection of claims 1,3,10 under 35 USC 103(a) over Melisaris et al. (US Patent 6,350,403) in view of Date et al. (WO 02/48101 wherein the citations are from the English equivalent document US Pg-Pub 2004/0030158) is withdrawn.

### ***Conclusion***

8. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

Art Unit: 1795

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. E./  
Examiner, Art Unit 1795

/Cynthia H Kelly/  
Supervisory Patent Examiner, Art Unit 1795